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COOP'S TECHNOLOGY DIGEST

-A Timely Report On The World Of Communications-

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August 23, 1995 / ISSUE 95-7-20

-IN THIS ISSUE-

Business Plan: Planning A Teleport

Prospective Customers? -p. 4; Uplink Mechanics & Costs -p.6;
Antennas vs. Antennas -p.8; The Electronics -p.9;
The USA Connection -p.10

TECHNOLOGY BYTES / INDUSTRY NEWS UPDATE

Filipino Channel, Asia **Business** News, **Chinese** Television Distribution -p.15
Optus B3 On Line - Functional -p.15; The **Music** Zone - Newest PAS-2 Programmer -p.16;
AsiaSat 2 Launch Report -p.16; Asia Television Network **Adding Programme** Channel -p.17;
Cable Television **Launch Set** In Australia: Foxtel In Front -p.18;
UK Announces Formal **Digital Television** / Radio Policy -p.19; Sony **Flat Screen** TVs -p.19;
Satellite Making Inroads into New Zealand Motor Inns, Motels -p.20;
Telecom 'Sky **Takeover**' -p.21

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ROBERT B. COOPER, P.O. BOX 330, MANGONUI, FAR NORTH (NEW ZEALAND)

COOP'S TECHNOLOGY DIGEST

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BUSINESS CHALLENGE: Planning A Teleport

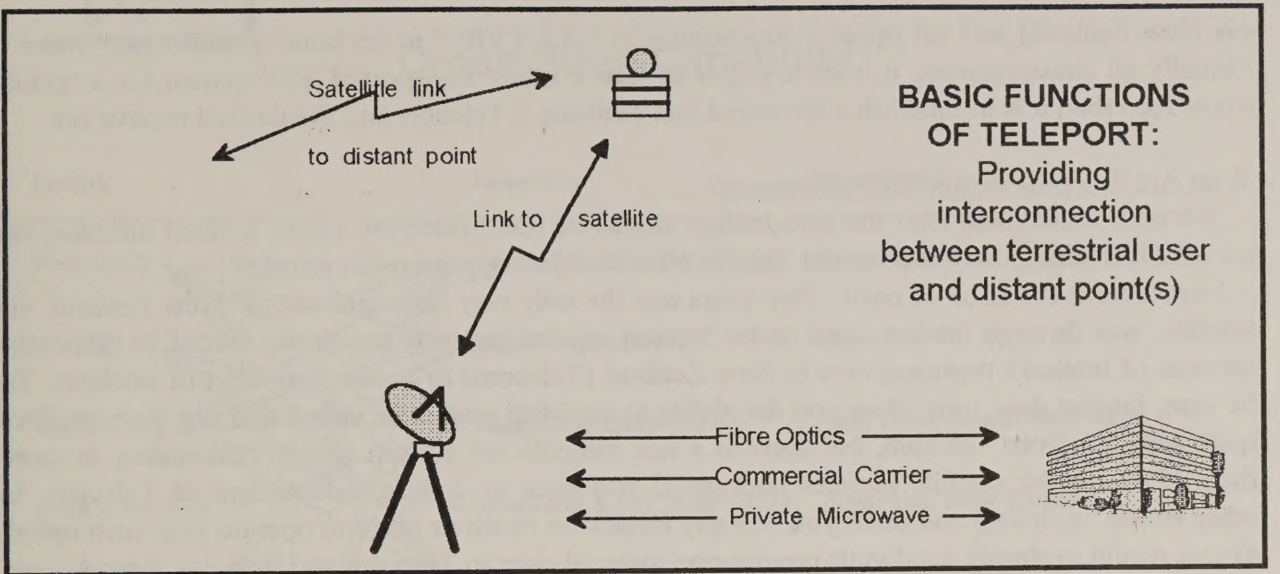
CTD 95-6 (June 30; p. 11) reported on an attempt to raise NZ$500,000 to create, with funds already pledged, the first privately owned "Teleport" in New Zealand. Interest in the subject has been significant which suggests readers might benefit from a general overview of the costs, operation, and potential revenue streams that would flow from such a business (investment).

A Teleport is a transmitting and receiving station operating in the uplink (to satellite) and downlink (from satellite) frequency ranges established by international agreement. In theory, no Teleport facility would be necessary if every user of satellite (relay) provided its own transmit and receive station. In practice, the cost associated with the transmit portion can be quite excessive and a single user cannot justify the initial capital expense short of full-time (24 hour) use of the facility. Furthermore, because of the equipment (in particular the transmit antenna) and radiated transmission power (operating in the microwave frequency range), not every existing business is able to place an uplink transmission facility adjacent to their existing premises. Uplink antennas, as we shall see, are typically quite large and transmission powers are high enough that there can be environmental concerns over radiation poisoning; uplink facilities must be mindful of human and animal life forms that might stray into the radiation beam.

None of these restrictions typically apply to receive only sites; satellite antennas plus electronics utilised to receive broadband (video) or narrowband (data, voice) downlink transmissions originating from a satellite. The transmission power levels and footprint for most of the present (and planned) geo-stationary Clarke Orbit satellites are sufficient to allow modest antennas in the 1 to 3 metre range for most such applications. And as a receive terminal radiates no significant energy, environmental concerns are not an issue.

A Teleport, then, is a transmit and receive station for hire. Customers are those who need a direct line to a satellite but who do not have the required uplink (transmission) capability, or, in some instances the downlink ability either. But to use the Teleport, some form of link must be provided between the Teleport and the user / customer. This terrestrial link may be privately owned or it may include interconnection abilities of an existing carrier. Telecom New Zealand, Clear and others would qualify as the terrestrial carrier link and they, like the Teleport, are "for hire" in this situation. To use a satellite link may require the services of the following outside supply companies:

1) A terrestrial carrier between the user's place of business and the Teleport
2) The Teleport operator
3) The satellite operator



BASIC FUNCTIONS OF TELEPORT: Providing interconnection between terrestrial user and distant point(s)

4) A teleport operator at the opposite "end" of the circuit
5) A terrestrial carrier at the opposite end

Satellite users fall into several broad categories. First, there is the distinction between:

1) A broadband spectrum user (i.e., someone transmitting video [plus companion audio] or high speed data which exceeds the kilobit rate available from conventional carriers such as Telecom;

2) A narrowband spectrum user (i.e., someone requiring a bandwidth that is more directly comparable to the bandwidth capabilities of the terrestrial telephone supplier).

With the rapid development of compression techniques, this distinction is beginning to blur and will blur still further as compression matures. That it will be possible one day within the foreseeable future to send full motion, full colour video over existing telephone circuits is accepted by most pundits. When this is economically available, the market niche now available for a Teleport operator will become smaller since most Teleport customers today require broad bandwidths not available to them through their local terrestrial telephone operator.

Within both broadband and narrowband user classes there is still another distinction: one way or two-way. Most Teleport users require distribution of material from their source point to some quantity of receive only sites. This is nothing more than a modern day adaptation of broadcasting with satellite relay substituted for the more traditional VHF or UHF telecasting networks. In this situation, whether the material being transmitted is broad or narrow in bandwidth, the Teleport operator's task is basically completed once the material has been relayed on to the satellite (operator). The Teleport operator directly uplinks to the satellite and at the satellite the satellite operator basically assumes responsibility for the further relay of the material. If the (single or multiple) receive site(s) to use this material make use of satellite received material as a part of their regular business routine, they will on their own install an 'RO' (receive only) terminal. If their primary use is television programme receive, the terminal is known in the trade as a 'TVRO' (television - receive only [terminal]). If it is for some narrowband format, it is known as an 'ARO' (audio [narrowband data] receive only [terminal]).

This further narrows the client base for Teleport operators since they can be economically bypassed for receive only applications with the installation of a typically (NZ)$5,000 - $10,000 range 'RO' system. Another 'competitor' for 'RO' site work to the Teleport operator is the trailer mounted transportable antenna which can be pulled behind a standard car to virtually any location (in New Zealand) and set up as a functioning 'ARO / TVRO' in an hour or less time. Under virtually all circumstances, it is far cheaper to hire a trailer transported 'RO' system for a special event feed than it is to establish a terrestrial link between a Teleport and the desired receive site.

Who Are Teleport Prospective Customers?

We now understand who the competition would be (i.e., Telecom, Clear, a client installing his own 'RO' or hiring one for a special 'feed'). What business opportunities remain?

First there is the issue of costs. Two years ago the only way "into and out of" New Zealand, via satellite, was through Intelsat. And under Intelsat regulations, you are almost forced to utilise the services of Intelsat's representative in New Zealand (Telecom) to access their fleet of satellites. To be sure, Intelsat does now allow you the ability to establish your own uplink and use their satellites quite separate from Telecom, but there is a not insignificant add-on charge (amounting to more than 25%) for the satellite services package if you elect to do this independent of Telecom. In other words, in dollars and cents you will pay Intelsat as much or more to operate your own uplink as you would to simply hand your programme material over to Telecom and then pay them to send it for you. That is, or course, what monopolies are all about.

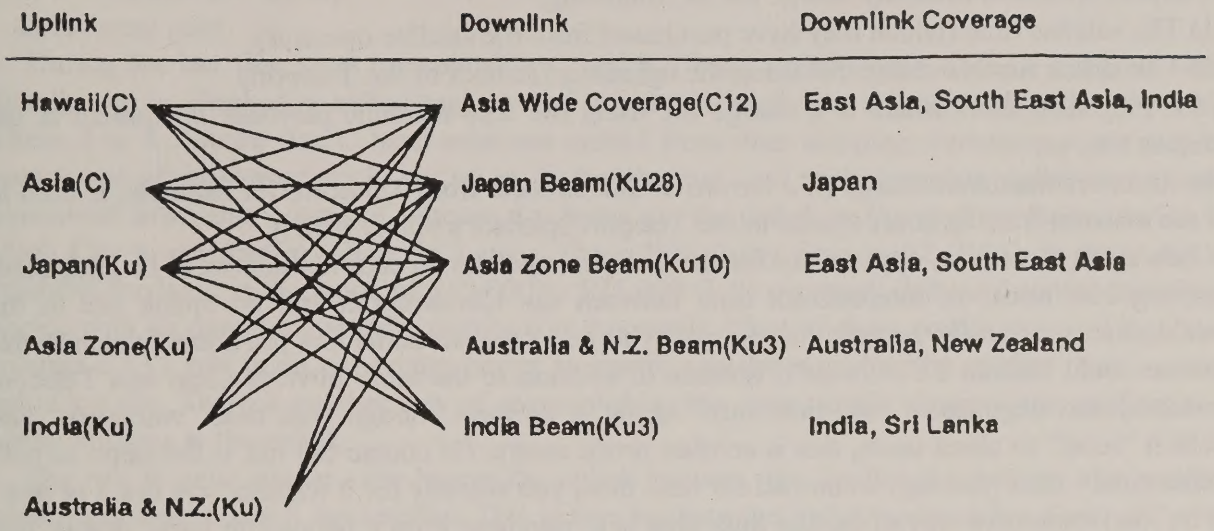
With the 1994 launch of Rimsat 1 and 2, and PanAmSat PAS-2, this situation has now turned around and for the first time it is possible (and legal) to uplink privately to any of these satellites you wish. Furthermore, with the August 29 launch this month of Japan's JCSAT-3, a launch before year's end of AsiaSat 2 and the launch during the first four months in 1996 of two new Palapa satellites (C1 and C2M), the ability to get out of New Zealand directly to a non-Intelsat satellite is increasing. Finally, add to this the activation earlier this month of Optus B3 and we now have two cross-Tasman satellites which are at least in theory capable of carrying New Zealand originated material to Australia and within New Zealand.

In dollars and cents it is now practical to distribute programming material directly from New Zealand to a very wide area at costs which are from 1/4th to 1/6th those demanded by the local Telecom plus Intelsat consortium. Anyone who has priced Intelsat connection fees (see CTD: 9408, p. 2 and 9405, p. 2) knows that for many business applications Telecom plus Intelsat charges are simply too expensive to make much sense for any use other than occasional very special events.

The existing Telecom facilities have a shortcoming: They are only through Intelsat satellites. This is not likely to change in the foreseeable future since Telecom and Intelsat have an agreement which prevents the telephone company from drifting off to competitive satellite systems. This, then, becomes a market opportunity for a Teleport operator; to make it possible to directly interconnect to any (or all) of the many new satellites now appearing in our westerly skies. It is the combination of cheaper non-Intelsat satellite rates and non-Telecom linking rates which creates the present business opportunity for a privately owned Teleport.

Some of the satellites have been designed with coverage to New Zealand in mind; their attempt to compete with the Telecom plus Intelsat lock now on the marketplace. JCSAT-3, for example, scheduled for launch into orbit at 128E in just a few days time, includes on board the ability to serve New Zealand with Ku band signals that from an 'RO' viewpoint will typically be under 1.5m in size. Furthermore, JCSAT-3 has built into the satellite the ability to "cross strap" or interconnect the New Zealand beam with any number of different combinations of other-end-coverage beams. A source in New Zealand can uplink to JCSAT-3 and be directed **(1)** back into New Zealand and Australia, or, **(2)** sent into the Indian subcontinent, or, **(3)** sent into Japan, or, **(4)** sent to Hawaii and North America. In return, any source at any of this locales can be redirected back to New

Cross-Strap Capability



Cross-Strapping ability of Japan's JCSAT-3 will allow Ku or C band interconnection throughout Asia as well as into North America through single satellite; the first of a new breed of "re-routing" satellites

Zealand (and Australia). Similar cross-strapping exists on the two new Palapa satellites to go into service during the first four months of 1996, and there is limited rudimentary cross-strapping also available on the existing PAS-2 satellite. An even more elaborate cross-strapping plan is included in a Filipino satellite presently scheduled for launch in December 1996.

All of this says that there are and will continue to be many new business opportunities for a Teleport operator in New Zealand who is prepared to provide customer access to a wide range of satellites now coming on line to serve the Pacific Ocean region. The distinction between the South Pacific and Asia will blur rapidly as these new generation satellites make possible low cost interconnection between the two regions, for either broad or narrowband communication users.

But there is more to being a Teleport operator than merely being available with the proper equipment to connect to (and from) a satellite; there is the brokerage of satellite time. Let us assume for discussion that as a Teleport operator you perceive the need for some volume of traffic to move from New Zealand to Japan and the USA. And you see the JCSAT-3 satellite as an appropriate relay to accomplish this goal. You have two choices: Call up JSSC each time you have a client and arrange for the relay, or, be a bulk buyer of time as a Teleport operator. If you elect the first option, each time you buy satellite time to carry the transmission of a client you will be paying the "rate card charges" for that time. That's like buying retail. On the other hand, if you have bought "bulk time" you simply connect yourself to the satellite on behalf of your client within the framework of your bulk time agreement and transmit. Now you are buying "wholesale" and you earn net revenues not only on providing the link itself but also on the difference between the "rate card charges" and your special "bulk time" purchase costs.

As a Teleport operator, in return for the risk incurred by buying bulk time (you will, after all, to come out on this have to sell a sizeable percentage of the bulk time you have purchased), you will now be earning a profit on the time as well. The difference between "rate card charges" and "bulk time buys" can be very significant - as much as 1/10th the cost. Which simply means that if you bought 100 hours of bulk time and resold 10 hours of that time at rate card charges you would break even.

Teleport operators routinely charge for the following:

1) The satellite time (which they have purchased from the satellite operator)
2) The uplink time (a charge for using the uplinking facilities of the Teleport)
3) "Playback time" which is a charge for using the tape machine playback equipment at the Teleport site, or,
4) An interconnection charge (if a terrestrial interconnect from Telecom, for example, is used to get the material from its source point to the Teleport operator's uplink facility.

Once again, here is an opportunity for the Teleport operator to earn net dollars. If he anticipates requiring 100 hours of interconnect time between say Christchurch and an uplink site in the Auckland area, annually, he now has the ability to go to the terrestrial link providers (which in this instance could include TVNZ's BCL division in addition to the more obvious Clear and Telecom providers) and negotiate a bulk time buy. Again, if he buys enough bulk time "wholesale" and resells it "retail" to client users, this is another profit centre. Of course the risk is the same as with satellite time - once you sign a contract for bulk time, you will pay for it whether you use it or not.

The least expensive way of having bulk time is to purchase it on a bandwidth basis; that is, you buy a stated amount of bandwidth for full-time use. In this way the bandwidth in question is yours to use anytime of day or night for any purpose. Some elementary math will illustrate:

1) Number of hours per year (365 days) = 8,760
2) Cost of a 36 MHz wide transponder for 8,760 hours continuous use on Rimsat G2 = US$975,000
3) Cost of one hour in US dollars for leased time = $111.30
4) August 1995 market pricing for short term use:
   a) One hour, one time - US$2,100
   b) 3 hours per day (1,095 hours per year) = US$650.00 (per hour)
   c) 6 hours per day (4,380 hours per year) = US$380.00 (per hour)

By selling 25% of the inventory (6 hours per day on average) at the 6 hour per day rate, the transponder leaseholder takes in US$1,664,400 for the satellite time alone (against an annual cost of US$975,000). Add to that the Teleport operator profits from providing uplinking, playback time and interconnection charges and you have the nucleus of a business plan.

Mechanically, most satellite operators contracting out bulk time require a down payment of approximately 25% at the time of signing an agreement with the balance in monthly instalments spread over the period of the contract. Only the Telecom+Intelsat agreements appear at this time to deviate from this 'norm' and they require more money up front and typically require far longer contract terms (5 to 10 years on average) before they will even talk with you concerning "bulk time." Hey, that's the stuff monopolies are made of, and one reason why PanAmSat, Rimsat, Palapa and AsiaSat should be successful in this field.

Uplink Mechanics: And Costs

You cannot build a Teleport with one or two antennas and expect to maintain market position in New Zealand. There are now, and there will be in the future, far too many satellites available with such an abundance of coverage areas and C or Ku band transponders on board that you cannot be effective with an antenna that stays anchored on a single satellite. Nor can you be competitive and effective with only the ability to point at one or two satellites at a time.

There are two basic ways of reaching a satellite with a Teleport:

1) Transmitter power, or,

2) Antenna gain.

During the last five years transportable C and Ku band uplinks have become available which literally can be checked as airline baggage and flown to virtually any site on earth with short notice. These 3 to 4.5 metre size C band antennas unfold from their shipping containers as an umbrella comes out of its storage sock, set up in an hour's time, and with complete uplink transmission equipment in another couple of suitcase size boxes put the uplink on the air from Bosnia to Ho Chi Minh City to a tennis match in Sri Lanka. These "Fly Away Terminals" (FATs in the trade) are available for lease in the range of $15,000 to $25,000 (US) per week delivered to the site of your choice with an operator; virtually anyplace in the world. Most of these (relatively speaking) 'small antenna FATs' rely upon transmitter power to ensure a quality signal to the satellite from a remote uplinking site. There is another way of accomplishing the same quality signal to the satellite; use a bigger antenna at the uplink.

The rule is quite simple - the bigger the uplink antenna, the smaller the amount of transmitter power required to reach the satellite. This is true because the uplink antenna is a form of "power multiplier" and as you increase the multiplication of transmitter power with a larger antenna, you may back off (reduce) the power of the actual transmitter. If the FATs could haul big antennas around and lower power transmitters, they would gladly do so.

Ten years ago every uplink station built was begun on paper using an Intelsat grading system. This dates back to the late 1960s when the satellite industry was very young and only huge (30 metre) antennas seemed to work properly. Over time the Intelsat consortium created their own 'standard' for uplinks and today they are graded as "Standard A", "Standard B" and "Standard C" systems. The C version systems are, by Intelsat decree, 7 metres in size and only adequate for 'RO' applications.

Shift now back to the FATs systems that employ antennas 3 to 4.5 metres in size for C band, as small as 1.8 metres in size for Ku band. How is this possible when the smallest Intelsat "Standard" terminal for transmit and receive is in the region of 13 metres in diameter? Politics is a part of the answer: Intelsat grade "suppliers" do far better selling a few dozen "Standard B" terminals per year than they would do selling hundreds of 3 metre FATs systems per year. So naturally they push Intelsat to "maintain high standards" when in fact the state of the art technology buried these standards as far back as a decade ago. Intelsat maintains the "Standards" by a very simple ploy; they can refuse to accept "traffic" (uplinked material) from any "non-standard" uplink terminal. That is a pretty powerful weapon.

During the 1970s and even through much of the 80s, many hundreds of Intelsat Standard B and A terminals were sold to operating partners such as Telecom. If you visit the Telecom Teleport near Warkworth (North Island) you will see today their standard A and B terminals still doing duty pointing at the Intelsat birds to our north. Look closely however - there on the ground near the facilities building is a much smaller 7 metre sized dish that is also functioning. It is not 3 metres - yet - but it is certainly a tiny replica of the 30m model that stands nearby.

The truth is the standard B and A terminals installed a decade or more ago around the world are coming down, often being given away to anyone who will spend the not inconsiderable dollars required to take them apart. Around his activity has sprung up a small cadre of firms that specialise in dismantling A and B terminals. They pay nothing or very little for the actual antenna, may spend as much as US$125,000 to get the antenna back into its original pieces (there are thousands of parts to an A or B terminal antenna) and into shipping containers to be resold to some new entrant into the Teleport business. A standing advertisement in an industry trade journal offers a standard A terminal, in containers ready to ship to your destination, for US$350,000. And that price is negotiable. In the real world, this antenna originally cost someone more than US$2m to purchase and perhaps as much as install. Today it is actually not much more than highly precision formed scrap steel. The buyer, if it actually sells, could spend another US$300,000 or more to get it put back together again.

With more and more powerful satellites, who really needs a standard A (30 metre) or even standard B (13 metre) antenna these days? One possible answer follows.

At the same firm that offers you a bargain priced 30m antenna for US$350,000 there are several dozen 7 to 9 metre range uplink antennas for C and Ku band available in the US$25,000 - $50,000 range. These are also dismantled, in containers, ready to ship to your site. An August quotation obtained by CTD offered to sell a 7.3m NEC brand uplink antenna for Ku band service for US$25,000, to ship it to New Zealand from the US for US$10,500 and to come down here and assemble it on a concrete pad and 'proof' (prove its performance) with a crew of three for another US$15,000. Thus for US$50,500, the buyer would have a perfectly suitable Ku band uplink antenna capable of accessing Rimsat, JCSAT-3 or PanAmSat.

An Antenna Is Not Always An Antenna:

Satellite up + downlink antennas all appear, at first glance, to be quite identical with only the size variation being an obvious difference. There are subtle, important differences which make some antennas suited for Teleport use, others not so. The most important design factor after proper size is rating for C or C + Ku. C band antennas, such as the 30m monster on offer for US$350,000, are often ineffective at Ku (the design tolerances for a Ku antenna must be 3 times as "tight" as for a C band antenna). With more and more traffic going to the higher frequency Ku band, C band only antennas are even less desirable and their true value is therefore lower and lower each year as more and more Ku satellites come on line.

The next most important criteria is the ability of the antenna to "track" the satellite belt. As the size of the antenna increases, pointing errors become increasingly important. With any satellite dish, pointing the dish directly at the satellite is mandatory; an exercise akin to threading a needle with a piece of thread. As the antennas grow larger the needle hole becomes smaller and smaller and the thread becomes significantly more difficult to mate with the hole. Dishes repoint from one satellite to another under motor drive control and knowing precisely where the hole is is of extreme importance.

A practical example. The Teleport operator has a contract to provide a link to PanAmSat PAS-2 from 7 to 7:30 PM and is then under contract to provide a consecutive feed through JCSAT-3 from 7:40 to 9 PM. This allows 10 minutes to move the dish from a satellite at 169 east to a new one at 128 east. The dish will cover the "distance" in two minutes time. The challenge is to find JCSAT-3 when you get to the general vicinity of 128E. Anyone who has ever attempted to find a satellite with a dish will tell you that unless you know precisely where JCSAT-3 is located, you could be days finding it with a "big" dish. The answer is found in the motor drive control system and the precision with which the dish's actual pointing direction is transmitted to a display panel at the operating position. This is part of the tracking mechanism and it is called the "read out system," which is controlled by computer software. The bigger the dish, the more difficult the tracking.

Many of the older antennas available at lower prices will not "track" the Clarke Orbit Belt; they were designed in an era when satellite antennas, having once located a satellite, virtually never moved from that satellite. The failure to track is a function of the dish mount (the steel that holds the dish upright and allows it to move on command). So now we have another reason why an antenna might be priced like a pile of scrap steel; a C band only dish that will not track is the least desirable of all antennas these days.

Finally there is the matter of how the antenna is "fed;" that's technical talk for getting the power of the transmitter to the dish's parabolic surface (on transmit) or the signal from the satellite off of the antenna surface and into the receive equipment (on receive). This is done with a secondary system called a "feed antenna." Again, there are possible variations; more than a dozen actually. First and foremost, the feed must be designed to function with the particular design of the parabolic antenna. There are "deep dish" designs and "shallow dish" designs and each requires a different feed. Then, there are variations in the polarisation of the signals to be transmitted and received; four in all: Linear vertical, linear horizontal, right hand circular and left hand circular. And, there are variations in the system that separates the transmitting function from the receiving function, plus more variations in the feeds when they are likely to be used for C band only, Ku band only, or the ultimate challenge, both C and Ku bands.

Unlike older antennas, an older feed (if designed properly) is less likely to have lost "value" with time. And the feed portion of the dish can easily cost as much or more than the dish proper when mating an appropriate feed with a well depreciated dish.

All of this (and more we have passed over) says that you cannot buy a used (or new) parabolic dish based upon (1) size, and, (2) price alone. A 30m dish in containers for US$350,000 weighs in the vicinity of 60 tons; what a buyer may be getting is tons of scrap steel in reality.

The Electronics

If the antenna system can be a dangerous purchase exercise, the electronics can be a nightmare. The number one criteria is flexibility while reliability is a close second. A Teleport operator contracting to provide a link to JCSAT-3 at 7:40PM has no margin for error. At the opposite end of the circuit someone is waiting for the feed to occur. Assume for a moment the feed is intended for a convention site in Las Vegas, Nevada and sitting in a room there are 3,000 people anticipating the delivery of the programme material. This is not an opportune time for a relay to quit, a switch to jam or a tape machine to develop a head clog. A properly designed uplink has full redundancy for the electronics; every item in the chain has a backup unit, and the system is designed to allow very rapid rerouting of the transmission material within the facility from one pathway to a replacement path. In effect, the electronic portion will as a rule of thumb cost twice as much as you might suspect because there are two pieces of equipment for every piece considered essential to the operation.

Many Teleport operators who purchase "bulk time" operate their links 24 hours a day, even when there is no customer. It is usually less expensive to add a few hours of wear and tear on the equipment by keeping it on full time than it is to turn equipment on and off on demand and discover only a few minutes before a scheduled customer feed that something has stopped working. Carrying this one step further, most uplinks also operate in something called "hot standby" which means the alternate (redundant) path equipment available for use is also kept "hot" and ready to go at all times.

The effect of this redundancy, alternate path switching and hot standby is on the bottom line of the Teleport. By having only one set of uplink electronics you run the very real risk that something will fail when you need it or while using it. This quickly translates to word of mouth reports the Teleport is unreliable and a loss of business (people do hire a Teleport to get information to a certain point in a hurry). The alternate to that is to employ a minimum of two complete sets of electronics and to run both sets in either "on" or "hot standby" at all times. In both cases, there are increases in operating costs and equipment replacement budget items but the system should seldom (if ever) be forced "off the air."

A Teleport, then, planning one or two antennas, no redundancy for the electronics, and by poor antenna choice limiting itself to a small portion of the Clarke Orbit Belt and only C band at that is a poor investment.

The USA Connection

The world's largest telecommunications market (the USA) is a desirable place to reach with a Teleport terminal in New Zealand. Over the next decade, the forecast is that the Indian subcontinent region will surpass Europe as the world's second largest telecommunications user. New Zealand, given the right satellite scenario, is capable of acting as a "link" between these two markets. And increasingly the USA will want to send material to and receive material from India and the surrounding countries.

Having a Teleport in New Zealand is not guarantee of being legally able to access either the USA or India through a satellite; there is the matter of "landing rights." Just as clipper ships of the 19th century were often refused the "right to land" so too are satellite signals on occasion denied the right to land in specific locations. Most of this problem can be traced to the original Intelsat monopoly which was formed initially as a consortium of participating member states. When Intelsat was created in the 1960s, New Zealand's participation was through the government owned and operated Post Office operated telephone system. Thus it was the New Zealand government proper that had acquired the "right" to use Intelsat, and correspondingly the right to communicate through the Intelsat system to any other "member country." When the telephone system became private, these "landing rights" went with the sale and now Telecom controls who may use Intelsat from New Zealand and for what charges. This is one of the major reasons why so little happened with satellite linking from New Zealand until the privately owned PanAmSat (PAS-2) satellite came along in mid 1994.

Unfortunately, being able to access PanAmSat from New Zealand is not a guarantee that the message material you send to PAS-2 will have automatic "landing rights" in the USA (or a host of other countries). Telecom through Intelsat still carries a big political and economic stick and in a variety of subtle ways it can "fight back" independent Teleports by encouraging the USA to deny "landing rights" to a non-Telecom Teleport here. All of this requires considerable time and political expertise to work out prior to building a Teleport regardless of the countries you intend to reach with the system. There is nothing automatic about "landing rights"; just because you can reach a satellite with your Teleport is not a guarantee that anyone on the other end can legally utilise your material. Or, transmit a message back to you through the same system. To more fully understand this particular problem, you start with Chris Underwood (Senior Advisor, Radio Spectrum Policy) at the Ministry of Commerce in Wellington (04-474-2699).

Not every business plan requires "landing rights" in the USA for success. If you could "tap into" the signals routinely transmitted by the US domestic satellite (DOMSAT) system, there is another possibility.

From most points in New Zealand a well positioned site can actually see as far east as approximately 110 degrees west longitude. This means that any satellite operating west of 110E can be accessed directly from New Zealand. It happens that there are presently 7 C band satellites operating between 110W and 137W, and all are filled (up to 24 channels each) with television programming.

Back in 1992, when Kiwi Cable TV in Paraparaumu installed its own "surplus" (as in old) 16 metre dish, some elementary tests were conducted to see if reception from any of these US satellites was possible. Those tests, carefully documented at the time, were conducted (it would turnout) with a less than desirable antenna feed which apparently was not properly installed. None the less, the tests did show that on at least a handful of TV programme channels the 16m dish was capable of bringing into New Zealand cable TV quality pictures and sound directly from the (US) DOMSATs. The tests were repeated this past June and July, this time with better feed equipment and feed adjustment, and a new set of receive electronics. The results were encouraging; more than 30 cable TV quality channels of reception from a variety of satellites and programming services (see sidebar, here). This time Kiwi Cable was equipped to measure and decipher three different transmission formats including the decades old analogue transmissions, the ten year old Videocipher encrypted analogue and the latest thing to come down the pike, digital. The digital results were especially spectacular since one of the advantages of a properly designed compressed digital system is that you lose all noise and undesirable artefacts once you acquire the signal.

What this says, on the surface, is that without the expense of purchasing relay transmission time and space on a Pacific region satellite such as PanAmSat PAS-2, 30 or more channels of TV programming could be imported directly into New Zealand from a properly designed dish in the 16m range. Kiwi Cable believes that by increasing the dish size to 22 metres or so, an additional 30-plus TV programme channels would be available.

So what might you do with 60-plus USA cable TV programme channels landed in New Zealand? The first answer is obvious - use them to build a cable TV industry here. A cable operator in New Zealand could certainly justify the cost of a 22m size dish if he could start into business with 60-plus USA TV programme channels; provided he was operating in a marketplace of sufficient size to justify such an expenditure. Kaitaia or Greymouth are obviously too small for such an expenditure; Christchurch and Wellington are not.

But why should several cable companies located throughout New Zealand each install a 22m size dish to access the same basic USA programme channels at all? Would it not be possible to build one such dish and then share the programming in some manner?

Contrary to popular misinformed myth, there is nothing "sweet" about the location of the present Kiwi Cable 16m dish; the (US) DOMSAT channels they have found are equally likely to be found at almost any location in New Zealand and at about the same signal levels. Tests run in Auckland using the Auckland University 7.3m dish confirm this (see SatFACTS February 1995, p. 2).

Once you have the signals in New Zealand, how do you retransport them to other New Zealand locations? Satellite is one answer. By employing digital compression techniques, as many as ten 'standard' TV programme channels will fit nicely into a 'standard' satellite transponder bandwidth. Using the Rimsat costing as an example (see p. 6 here), a single transponder leases for US$975,000 per year. By feeding ten USA-direct TV programme channels through this transponder, small Ku band dishes in the region of 3 metre size would have access throughout New Zealand (and the majority of Australia) to all 10 programme service channels at a daily cost of US$2,671. The transponder time alone, then, suggests that if the ten programme channels could be resold in New Zealand (and one day after July 1997 in Australia as well) for approximately

A/NZ$10 per month per home, you would need no fewer than 8,000 paying cable TV subscribers at the end of the system (i.e., on cable TV systems) to pay the monthly transponder bill. Unfortunately there are costs other than the transponder alone:

1) Programme rights fees

2) Retirement of capital investment debt for the 16/22m downlink antenna(s), receive electronics

3) Operational costs for the downlink and the 24 hour per day uplink to RIMSAT

4) A reasonable profit for the investment

All of this suggests a need for a "cable subscriber base" significantly larger than the 8,000 previously cited; a number approaching 50,000 in fact seems on careful analysis to be a bare minimum.

Another approach to getting the programming around New Zealand to the various communities that could have cable TV involves renting bandwidth from Telecom or Clear/BCL on their fibre optic rings. Kiwi Cable has explored this possibility but these are early days for both pricing and technical capability assessments.

THOSE ELUSIVE AMERICAN SIGNALS

High on the list of possibly 'commercially valuable' signals are the (US) DOMSAT transmissions recently shown to be viable with a dish of 16m size and up by Kiwi Cable (Paraparaumu). Presently, there are 7 separate satellites located between 116 west and 137 west, all on C band. For reasons not fully understood at this time, not every transponder on each satellite arrives in New Zealand with usable signals; even on a 16m dish. Tests suggest the following are usable:

Location	**Satellite**	**Total TV**	**Usable TV**
116.8W	Morelos 2	8	unknown
123W	Telstar 303	16	4+
125W	Galaxy 5	24	10+
131W	Satcom C3	23	16+
133W	Galaxy 1R	23	10+
135W	Satcom C4	23	16+
137W	Satcom C1	23	12+

Of particular interest are the MPEG digital signals, just now beginning to appear in quantity and replacing older analogue feeds. These signals are remarkably 'clean' and require a minimum of special handling.

There is an underlying problem with this business plan; copyright. Although it might be assumed that a US cable TV programmer would be overjoyed at adding as many as 50,000 new "subscribers" to their service in New Zealand at no direct expense to themselves (i.e., the satellite signal for North America is received at New Zealand expense in New Zealand), this is often not the case. Copyright remains a problem.

US cable programming falls into two broad categories:

1) Programming that is broadcast free to air (i.e., anyone with receiving equipment can view)

2) Programming for which there is "conditional access."

The "condition" is that the user be willing to pay for the service, and a part of this payment ends up going to the copyright owner of the programming. The free to air (FTA) services are either advertising supported and/or they have a particular "message" that crosses over copyright boundaries. An example of the latter is the Eternal Word Network, operated by a Catholic church group. As you might suspect, the more cable-desirable programming is encrypted (i.e., conditional access) and in theory the copyright owner knows or has the right to know where each viewer receiving the programming resides.

Two of the "crystal clear" programming choices found with the Kiwi Cable 16m dish are Viewers Choice and Request TV. These are movie channel services, operated such that viewers have the ability to tune in a very recent feature movie with a new start time every 15 to 30 minutes. Viewers in North America subscribe to the service on a per movie, per day, per week or per month basis and pay accordingly. As we discussed in CTD for May 31 (p. 7), movies are released to theatres in the United States as much as six months ahead of their release in New Zealand, and they are subsequently released to movie programmers such as Request TV and Viewers Choice either just before or at the same time as they may be showing up first here in theatres. The problem is obvious - how does the movie firm protect its New Zealand distribution of theatre release movies if by this quirk of technology the same movies are flowing into our cable TV homes at the same time? The answer is that this is a problem still remaining to be sorted. And for now, although the reception quality is very high, neither of these two services is going to be willing to talk New Zealand affiliation. Request and Viewers would love to have New Zealand subscribers; the movie production rights firms that own the films do not share that enthusiasm.

Most cable programmers in the US now purchase use rights only for the US (plus Canada and possibly Mexico). In the latest contracts, some films and programming also "throw in" the Caribbean as a bonus since there are hundreds of thousands of home and cable dish viewers in that region now. But New Zealand - is simply too far outside of the "North American marketplace" to fit conveniently.

This says that although the programming may be technically received here, and on a private basis it might be possible to work out the conditional access challenge, transferring that to thousands or tens of thousands of homes for widescale cable redistribution is a business bridge yet to be crossed. Therefore of the 60-plus channels that one or more 22m dish(es) might actually bring to New Zealand from North America, in the real world as few as 10-12 could be instantly used by a cable system operator without negotiating (one at a time) use rights for New Zealand. And the programming value (i.e., viewer attraction) for those that could be used without formal negotiation is minimal at best.

At the opposite extreme, just above the western horizon, will be the AsiaSat 2 business opportunity. So close to the horizon as to require extra care (and expensively designed) dish receiving systems in New Zealand, AsiaSat 2 will however offer as many as 10 FTA cable programming channels and upwards of 40 conditional access channels. Not every location in New Zealand will be able to "see" this satellite; in fact, perhaps as few as 10% of all locations will be so fortunate. This creates a scenario similar in challenge to the (US) DOMSAT reception; an opportunity for a Teleport to design the necessary equipment to bring in clean AsiaSat 2 signals. But then we are back to square one: How do these signals get shuttled around the balance of New Zealand? The answers are the same as for the DOMSATs; satellite, fibre optic ring links and possibly in major metropolitan centres the use of point to point microwave.

At least one planner here believes the ultimate answer is a "dish antenna farm" with perhaps eight dishes each designed to rest full-time on a selection of satellites that span the sky from the DOMSATs in the east to AsiaSat 2 in the west. This plan would "cherry pick" several programme channels per satellite and ultimately end up with a bundle of 30 or more taken from multiple satellites. These channels would then be married with New Zealand bred special interest programming and redistributed via a Ku band satellite link throughout not only New Zealand but the entire (south) Pacific. In effect, one (giant) cable headend to serve all of the region, reducing the (remote) cable system equipment requirement to a single 3m size Ku band dish pointed at a single satellite. By using (present day) compressed digital technology, 3 Ku band transponders would ultimately be required to deliver the 30 planned channels.

The positive side of this, from the (remote) cable operator's viewpoint, is that he has a far smaller investment in satellite equipment, and will br able to serve very small systems of 100 or fewer subscribers because the cost per installation has been reduced so dramatically.

One of the major problems remaining to be resolved is "When to do this?" The technology and hardware exists today but two years from now it will exist in a far cheaper format with several interesting advantages. Foremost of these will be the ability to deliver the compressed digital service through the cable network directly into each home where a set top cable digital to analogue converter will bring the programmes back to standard analogue viewing format. This will allow the cable operator to avoid virtually all of the normal cable headend equipment and shift the burden of capital cost to the subscribing home. Some suggest that this technique will replace today's conventional "analogue" cable TV systems and greatly reduce the minimum community size required to provide profitable cable service. When a simplistic 3m size dish can serve 25 to 100 homes, profitably, the entire economics of cable will change rapidly and perhaps put an end to the expensive city wide systems of the present day.

Is There A Business Here?

How does a Teleport fit into these and other scenarios? By the year 2010, individual satellites in Clarke Orbit will talk directly to one another; giant switchboards in the sky. A message originating in New York and intended for Auckland will route itself (with the help of some software) from satellite to satellite never touching the ground until it arrives in Auckland. But, for the next 15 years, there will continue to be a growing need for accessing satellites from the ground, for selecting which satellite is the best one for a particular route, and for combining the services of several satellites into a single feed for users such as cable TV. And sooner or later, New Zealand will have at least one privately owned operational Teleport.

MEET
CYNTHIA DICKINS

Sydney Office
PanAmSat

One of the satellite professionals to be on
hand at **SPACE** Pacific's
South Pacific Region Satellite & Cable Show
January 23-27 in Auckland.

Invitations are now available to attend the premiere hands-on management and technical forum of the Pacific region satellite and cable television industries.

January 23rd: SPACE's annual 'Antenna Raising Party'
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January 27th: 'Public Access Day'
Invitations mailed upon request: Fax 64-9-406-1083

TECHNOLOGY BYTES

...BITS and BYTES you may have missed in the rush to make a buck ...

August 23, 1995 / ISSUE 95-7-20

SATELLITE TV and RADIO

On Again / Off Again. Announcement appearing in SatFACTS August 15 (p. 21) that ABS-CBN 'The Filipino Channel' would be available through SPACE Pacific dealers at US$50 per year now appears to have been premature. Filipino channel negotiator had reached understanding with SPACE August 4 under which TFC would deal directly with SPACE Installer / Dealer members to arrange individual home 'DTH' subscriptions to their 24 hour MPEG (Digicipher) service presently on PAS-2. Under the agreement, TFC would authorise for demonstration purposes IRD units owned by SPACE dealers and provide marketing materials to aid dealers with promotion. The TFC service utilises GI's Digicipher and the top-end receivers (DSR 1500) are NZ$3,700 while the lower end unit (DSR 2200) is NZ$2,995 from Maser Technology Group (Auckland). SPACE's function was to provide overall marketing assistance and co-ordination of TFC / Dealer member efforts. The deal was not to be exclusive; TFC would also be free to market their channel through other (marketing) organisations as well. TFC's Gina Leviste on August 18 advised SPACE they were rethinking the arrangement and cited 'conflicts' with other potential TFC distributors as a reason.

ABN (Asia Business News) has appointed Palmerston North Telsat Communications as a representative for sale of commercial and home (DTH) subscriptions but the appointment is not "exclusive" to Telsat. ABN advises they will reserve certain of the marketing rights to themselves (mentioning the possible sale of service to Sky at some future date) and may in fact appoint additional representatives for the non-reserved market areas in New Zealand. New Zealander Chris Wanden, ex-BCL, continues to be in charge of ABN marketing in this region (ABN Fax 65-323-0788). Telsat has been successful in forcing a Scientific Atlanta model D9222 IRD, designed for but a single MPEG programme channel at a time, to work alternately between CMT and ABN. There is a shortfall, however: The IRD must be reprogrammed for incoming (input) frequency manually, and typically requires 30 seconds time for someone who has practised this several times. Users of D9222 units will not be doing channel surfing between CMT and ABN (!)

Chinese Television Network (CTN) marketing visit to New Zealand and Australia has apparently produced no contracts with proposed programming distribution firms in either country. K.F. Lau, Senior Marketing Manager, visited here late in July and then went to Australia hoping to select from amongst numerous candidates a firm that would market their 24 hour Mandarin all news programme channel. Major stumbling blocks were apparently significant up front fees required by CTN to "qualify" a distributor, short (one year) contract term with no promise of renewal nor renewal based upon distributor performance, insistence that CTN act as 'middle man' supplier for IRD units adding both mark-up to units (they already cost US$1,445 for CMT service plus gst to New Zealand) and requiring extra shipping at considerable per unit expense from Hong Kong. Another problem: The second CTN channel, Dadi, has now been delayed until "*sometime after the middle of 1996*" which means a distributor here would see his contract run out at about the time the second programme channel became available. One applicant distributor calculated he would have to sell nearly 900 IRD equipped systems to Mandarin families in New Zealand to break even in first year, and with no contract assurance his firm would be awarded a second (et al) year, it was a dangerous investment.

Optus is marking its tenth anniversary with a major Australian press event being held August 21 in Sydney. Optus B3 (156E, replacing A3 at that location) came on line August 7th approximately one week ahead of a targeted August 15 date. Early indications are that the B3 service levels as received in New Zealand are comparable to, or slightly better than the B1 satellite on at least the Australian SE beam vertically polarised channels. One of the strongest Optus signals ever encountered in New Zealand is found on B3 transponder 5; Q-NET. This is a television service channel for Queensland and includes educational training, medical training and other non-broadcast television services. It is in B-MAC encryption mode. New Zealand observers claim the signal is so strong as to be usable on dishes as small as 60cm in size. At our CTD press deadline, test signals from Galaxy on the horizontal transponders of B3 had not yet appeared. The plan is for Galaxy to make their Pace/Irdeto MPEG encryption system roll out as quickly as possible on B3, then to replace approximately 400 GI Digicipher receive sites presently taking Galaxy from B1 with the Pace/Irdeto service on B3. At that time the GI system will be turned off, and Galaxy will be ready to launch their own DTH sales and marketing campaign throughout Australia. Galaxy continues to insist that because of copyright restrictions, New Zealand users will not be accommodated even if the B3 signals turn out to be at usable levels here.

Galaxy's MMDS and soon to be B3 delivered DTH service expansion from 9 to 13 channels involves an attempt to position itself to be competitive to the cable offerings of Foxtel and Optus. Galaxy has recently announced the addition of US bred satellite delivered Discovery Channel, and expects to name three additional new services by the end of September. Discovery will replace the Australian created Quest Channel service on November 1st over Galaxy and some Quest staffers will be picked up by Discovery (Asia, Inc.) in the process. They will also be changing the on-air name of their all music, all the time channel (now called 'Red') to "Channel V," which not coincidentally is also the name of the Murdoch all music service presently available on AsiaSat 1 and soon to be available on AsiaSat 2. Whether this is simply reuse of a Murdoch name, or whether Asia's Channel V will replace the Australian created "Channel V" has not been announced. One of the remaining "to be announced" Galaxy service channels could be "AIM," created by a joint venture of ABC, John Fairfax Holdings and US cable operator Cox Communications. This channel, AIM says, will combine news, children's programming and general entertainment. AIM is 51% owned by ABC.

PanAmSat's PAS-4 satellite was successfully launched into orbit on August 4th (NZ time) and has subsequently arrived at its orbital location of 68.5E where it began tests on August 15th. The satellite is unfurling antennas and solar panels at this time, under ground control, and should begin operational testing of the 16 C band and 24 Ku band transponders on board in early September. One of the new pay TV service operators waiting for PAS-4 service to begin is Multichoice TV which will distribute 16 television and some number of radio programme channels. Amongst the service offerings will be CNN International, Sky Television (London), ESPN, Hallmark Entertainment, the Science Fiction (SciFi) channel, the Travel Channel, TNT Classic Movies and SelectTV. On the audio side, 40 specialist music channel services without interruption or announcers plus Voice of America and Johannesburg Radio 702 will be on offer.

Turner International Australia Pty's co-ordination of authorisation for TNT + Cartoon Channel service has shifted to Sydney proper. Earliest Scientific Atlanta B-MAC 97808 IRDs were shipped from SA Canadian facility and authorisation was managed by Hong Kong uplink site for TNT. Now, anyone with problems in getting approval for an IRD or in having IRD authorised is to contact Yvette Jollye at Turner Sydney (tel. 61-2-9900-3111; Fax 61-2-957-5472).

The Music Zone (TMZ) Global Music Network is the latest PanAmSat PAS-2 programme source. TMZ is feeding programming into Australia as a part of the Digicipher MPEG data stream appearing on transponder 9V (along with Prime Sports, Showtime and Encore). Officials at TMZ say they are investigating potential outlets for the service at this time; no rate structure has been announced. TMZ is similar in concept to MTV and other all music, all the time programmers. Details from Sam Klosterman (tel. 303-267-7006; Fax 303-267-7007).

Japan's JCSAT-3, a significant new satellite with 12 C band and 28 Ku band transponders on board, is scheduled for launch at 12:39 PM August 29th to an ultimate Clarke Orbit location of 128E. This is the first time that the Japanese satellite industry has created a satellite to compete on an international basis for transponder business outside of Japan proper. The satellite has Ku spot beams that focus on New Zealand, Australia, India and portions of Asia outside of Japan, as well as a C band signal contour that covers all of mainland Asia at 37 dBw or greater. C band coverage across New Zealand and Australia is in the 25 to 26 dBw range (4 to 5 metre size antennas); the Ku spot beams to New Zealand are at 46 dBw which translates to 1 metre range antennas. JCSAT has made no advance announcement of users but at least two groups are known, including one Nepal based firm that plans 24 hour programming into Indian cable TV systems. The Indian government has issued statements condemning the Japanese satellite launch as an "*incursion into Indian air space*" although the satellite in no way impinges upon Indian Clarke Orbit Belt locations. The Indian government seems to be more concerned that programmers will increasingly utilise non-Indian satellites to reach the country's rapidly expanding cable TV system world and their protest is more economic than political.

AsiaSat 2 satellite, to carry STAR TV, Deutsche Welle, Indovision and numerous Asian TV broadcasters, has been rescheduled for a launch window between 30 September and 30 October. At the same time, follow-on launch of US DBS broadcaster EchoStar's first high power Ku band Martin Marietta built satellite has been announced for the 30 October - 30 November launch window. Both satellites have been delayed launch following the loss of ApStar 1 satellite in January by the Chinese Xichang launch facility. The Chinese recently announced the loss of AP2 was caused by a *"wind sheer anomaly"* in the upper atmosphere above the launch site. The launch vehicle blew up shortly after lift off showering the country side with debris, killing 6 and injuring 30.

Turner's CNN has broken new ground by being the first non-Indian telecaster to be allowed to lease transponder space on the Indian national satellite system, Insat. Turner will pay US$1.5m per year for access to a 24 hour transponder for distribution of CNNI on Insat 2B. There was spirited response from opposition political leaders who charged CNNI was *"insensitive to Indian culture and national concerns."* In the same agreement, CNNI will begin carrying a 5 minute daily report from Indian state broadcaster Doordarshan within its World Report segment that is distributed world-wide, will allow Doordarshan to compile up to 1 hour daily from CNN for distribution through the network's terrestrial channel service, and Doordarshan will provide Indian content news for up to 2 hours per day via the CNNI channel on Insat 2B.

Sony Pictures Entertainment, Inc. in a joint venture partnership with Singapore based Argos Communications Enterprises Pte. has announced plans to provide a movie and general entertainment channel to Indian cable and SMATV subscribers by the end of the year. The new service, in Hindi and to be called Sony Entertainment Television (SET), on recently launched PAS-4, will be advertiser supported and will be 'sold' to cable operators on a free to air (FTA) basis. The channel will include a mixture of Sony's TriStar Pictures and Columbia Pictures film library along with Indian film and entertainment product; a second Tamil language channel is planned. India's cable TV boom continues with an estimated 15,000,000 homes now connected and no slow down in growth likely for several years. A growing and now extensive Indian middle class is the target audience.

India's Insat 2C satellite is scheduled for Indian launch in September to 83E replacing Insat 1D presently at that location. The Indians have also requested three new orbital locations from the ITU at 48E, 55E and 111E. Presently, in addition to 83E, India has Insat 2A at 74 east and 2B at 93.5E. They have also requested ITU permission to add Ku band transmissions to their 74E location.

India TV has begin services in analogue format on Intelsat 704 at 66E. The service, described as "general entertainment," is being uplinked from Sri Lanka in a tax move that allows Indian advertisers to pay in Indian Rupees and avoid government limits on the transfer of funds outside of the country. India TV plans an early switch from analogue to MPEG digital but like many programmers must await the availability of sufficient IRD units to make the switch.

Indian telecaster BITV, seen since June on Russian Stationar 3 at 85E, is anticipating the launch during September of Russian Express class satellite to replace the ageing Stationar. Russia operates C band satellites at 84.0, 84.5 and 89.9 (E) and this has been a parking zone for mostly 'dead' satellites for a couple of years. The exact orbit location for the (new) Express 6 satellite will only be known when it reaches destination but someplace between 84 and 90E is likely.

Grundig satellite TV receivers and dish antenna models, now being marketed throughout Indian by satellite programmer Asia Television Network (ATN), will be manufactured in India by the end of the year. Grundig and General Telecommunications Ltd. have signed an agreement to joint venture a new Indian manufacturing facility that will also produce high end consumer electronics items for the Indian / Asian market.

Asia Television Network (ATN) has announced plans to split their present transponder space on Rimsat G2 (TR R6) into a pair of separate programme channels. The present service channel, widely seen in New Zealand and Australia on 3 to 3.7m size dishes, will be continued in its mostly Indian music video format; the second programme channel will feature sitcoms and general entertainment programming. Some of the latter has been scheduled on their present Rimsat channel for several months, apparently a work up to providing two separate (half transponder format) programmes.

ESPN is scheduled to launch service into India in late September - early October but is facing significant challenges. The service will be encrypted and will only be available through cable TV operators. The target price is Rs 20-30 per month per cable home, less than a Kiwi penny per day. Cable operators in India, however, have shown a firm resolve to not pay for most services and those that have attempted this form of distribution previously (such as STAR Movies, Zee Cinema and MovieClub) have had extensive problems. The typically small Indian cable TV system willingly purchases a single decoder but pretends it is for a private home and thus pays the minimum amount per month without sharing the revenues from cable subscribers with the programmers. ESPN hopes to beat this problem by forming a partnership with Modi Entertainment, an Indian company that will activate no fewer than 50

UPDATE: Cable Television Prepares For Launch in Australia

Australia's two major cable television competitors, Foxtel and Optus, are rushing to liftoff. At stake is the future of telephone telecommunications in Australia.

Foxtel, the merged conglomerate composed of Rupert Murdoch's News Corporation and telephone operator Telstra (CTD 9504; p. 7), will initially offer 20-22 channels of programming in all state capitals save Darwin sometime in the latter part of September. Portions of the Gold Coast are scheduled to launch in October.

Optus Cable is less certain of the number of channels ("20 to 30") or the precise launch dates ("September or October"). As an almost aside, the previously MMDS launched pay television service Galaxy with its 9 current channels and as many as four more to be added "soon" hopes to launch its own (Optus B3 delivered) satellite direct to home (DTH) service by 1 October. But Galaxy is yesterday's headlines (CTD: 9504; p. 2) and most of the media hype and attention is focusing now on the offerings of the cable firms.

At least in the early days, few possible cable consumers are likely to be faced with a choice between Foxtel and Optus; while both will ultimately be passing by the same homes at the end of the race, at the start they seem to be steering slightly different terrain courses. Foxtel is placing its wires mostly underground using the resource of ducting brought to the party by Telstra. Optus, unable to secure duct space from Telstra at pricing it considers suitable, has gone into the air by working out pole rental space agreements with local and regional electrical suppliers. And in fact, there are nearly 60 cable TV licensees in Australia now, each with the ability to wire a region of the country and out of the Optus plan to utilise power poles for cable suspension has come an initiative to gather together as cable licensees to negotiate for pole right rates. Optus has not indicated what it is planning to pay for pole space but some others have; the rates being negotiated are by world standards extraordinarily high: A$30 per pole per year plus 10% of the cable company gross receipts. And in most all cases the cable operators are being forced to allow the power company to install the wires and equipment as a contractor at rates which have cable licensees very upset. In comparison, the average rate in the US is under US$4 per pole per year and the power (or telephone) company receives none of the cable firm's gross receipts.

On the cash receipts side, neither Optus nor Foxtel are announcing (yet) their intended rates which leaves the Galaxy DTH service, a sort of competitor, as the benchmark: A$299 installation and A$49.95 per month for 9 (to be 13) channels. Foxtel has quoted potential customers an installation fee "between (A)$100 and $150 and a monthly service fee between (A)$45 and $50."

For speed, Foxtel claims to be ahead stating they will be "passing" 700,000 homes by 1 October; Optus is aiming at passing 100,000 by the end of this year. Down the road, as mature systems, Foxtel claims they will pass 4 million, Optus 3 million. Optus Vision is saving Perth at this stage and smaller, regional centres will be the last to be cabled. Middle size regionals will be served sooner by independents; East Coast TV at Wollongong and PayNet in Townsville/Cairns are two examples.

regional offices for ESPN throughout the country. From each office field personnel will "police" the cable operators to ensure that ESPN is more properly paid on a per subscriber basis. ESPN does not plan to allow individual (DTH) subscriptions to its service and thus unlike STAR Movies and others that sell to both cable and DTH, they will not have the problem of determining whether a subscriber is a single home or a cable system in disguise as a single home. ESPN has followed a similar policy in the Pacific and by denying individual home DTH subscribers, is not faced with determining how its service is being utilised.

Linking: In line with our feature report (p.2 this issue) on Teleports, here is an example of how Asia Business News (PAS-2) manages to feed from the New York studios of the Wall Street Journal (WSJ) 40 minutes of live (US) reports each day: WSJ to (US) DOMSAT, thence to BT to EBN, thence BT uplink to Intelsat Indian Ocean Region bird IOR57, thence downlink in Sydney and uplink on Intelsat Pacific Ocean Region 180 and downlink in Singapore at TCS for microwave connection to ABN. ABN would rather take the IOR57 feed directly in Singapore but the high costs of taking the feed from there makes it less expensive to downlink in Sydney and re-uplink onto POR180 for the final leg into Singapore. For ABN feeds to Europe, they go the opposite direction: ABN microwave to TCS uplink to Palapa B2P, downlink Hong Kong and uplink to POR180 which is down linked in Canada (Lake Cowhican) and uplinked via Atlantic Ocean Region Intelsat 37 for downlinking by BT which feeds it to EBN for uplink to the EBN transponder for "live" coverage into Europe. And you thought directions to get to a mate's house were complicated!

Optus continues to try to convince Maori radio operators (Te Mangai Paho) that their satellite relay (Omnicast) is the most cost effective and flexible system for updating their existing Telecom wire linked network system. Optus is suggesting permanent uplink sites at Wellington and Auckland be supplemented by a "mobile uplink " station that could deliver remote area event broadcasts back into the network through Optus relay. Many Maori radio managers are objecting to what they see as a backwards step as through satellite they will lose their present day ability to both send and receive programming material via their full-time wire links. The basic Optus system is one-way as now planned and to build into each of some 20-plus transmitter sites the ability to uplink as well as downlink is far greater than the budget amount created for the project by New Zealand On Air.

American NBC network has won commercial rights to 2000 Olympic games in Sydney and 2002 winter games in Sale Lake City (Utah) with bid of US1.37B. NBC says that it will share its commercial coverage with its affiliated satellite delivered cable network CNBC (available on PAS-2 in Pacific, to also be available on AsiaSat 2 through a deal with STAR TV).

Wellington DTH and commercial satellite system supplier Doug Walkin has formed "Satellite Users Interest Group" which meets 1st Friday of each month at Rock Communications, 5PM; information at 04-801-7578.

DIGITAL TV and RADIO

UK has announced formal plan for conversion of all television and (FM) radio broadcasting to digital service which government hopes will begin broadcasting "by early in 1997." Under plan, digital programme channels (called multiplexes) will be reserved within new national allocations programme for existing BBC, ITV, Ch. 4, Ch. 5 and Ch. S4C services. Additional telecasters would then be allowed to bid on remaining multiplexes on offer. Six separate 8 MHz wide UHF television channels are to be allocated for the new digital services, each of which will be capable of handling upwards of 3 multiplex programme services. Additionally, each 8 MHz channel will also be capable of carrying 7 or more CD quality radio multiplex service channels, in effect marrying radio and TV because of their shared multiplexed digital format to a single spectrum region. Proposed rules were published August 10th and comments will be received until October 6th.

Hyundai claims to have created a MPEG 2 decoder unit that processes audio and video streams on a single chip. The HDM8211M SAVi decoder accepts compressed digital data streams, sorts them into video, audio, text and private data, and processes them on to graphics and audio generators. Hyundai begins chip shipment this month from Korean plant, forecasts 3.5 million unit annual volume by mid 1996. Initial pricing is US$190 for sample chips, expecting the pricing to be US$55 per chip in volume lots.

European Union has adopted law that requires all digital TV channels to be based upon 'DVB Compliant' standard; TV receivers of 17" size and over are to also have SCART open interface socket fitted.

CONSUMER ELECTRONICS

Sony will call their first flat screen wall mount TV Plasmatron and expects it to be on sale in Japan in 20 - 50" screen sizes as early as October 1996. The prototypes are being shown at IFA Berlin later this month. Sony says no pricing has been established and shipment outside of Japan plans have not been finalised. The technique is a mixture of technologies and an operating prototype shown had a 16:9 widescreen screen with a brightness level of 250 candela per square metre. The prototype unit had a thickness of around 75mm but Sony claims the commercial consumer units will have a thickness of only 4mm. First consumer models will be 25" (635mm) while 40" (1016mm) will follow. Two other Japanese manufacturers are committed at this time to Plasma type displays; Mitsubishi plans a TV set using this display technology late in 1996 while Fujitsu is presently constructing a new manufacturing facility to build 42" (1067mm) size screen receivers.

Sanyo says they have created a 3D television display system that adds depth to images transmitted in standard 2d format. The product went on sale in Japan at US$4,525 in mid-July. The TV set must be viewed with wireless connected glasses that contain an "LCD shutter" to build separate images for each eye. In essence, this is a TV set without a display screen since the image is only seen when wearing the glasses. Previous attempts to accomplish this has resulted in images that were artificially deep and watching them produced severe eyestrain. Sanyo says that extensive testing of hundreds of viewers over viewing periods of 4 hours and more reveals no ill effects.

Last American owned TV and consumer electronics manufacturer, (the) Zenith Corporation, has been sold to foreign interests. No major, national brand of consumer electronics remains in the USA. Purchaser is LG Electronics of Korea who bought controlling interest; you know LGE better under their GoldStar brand name here in New Zealand. Zenith has had continuing losses, but perhaps the best 'name' in consumer electronics in US for some thirty years. The company pioneered over the air pay television in the 1940s and was a major partner with the (US) CBS network in developing the first commercially viable colour television system used in US (not NTSC). On announcement by LGE in Korea of the acquisition, LGE stock fell to year's low on Seoul exchange.

America's best selling line of personal computer products, Packard Bell, has sold a minority interest share to Japan's NEC; 19.99%. The marriage of the two is expected to produce benefits on both sides. Packard Bell has grown from below US$1B in sales in 1992 to more than US$3B in 1994 and has been searching for a moneyed partner to finance its needed production expansion. In return, NEC will gain access to the technology and software that has made PB the best selling PC brand in US while PB will gain access to the large scale professional line of computers for office and industry use at which NEC excels.

Latest electronic craze to strike Japan; PHS or personal handyphone service. It works this way. Thousands of "mini-cell sites" have been built in Tokyo and major centres and people pay one time fee of US$85 for a telephone instrument plus US$30 per month to be able to make telephone calls at rate that is 20% of existing cellular calls (US$0.47 for 3 minute call). The technology is basically that of wireless personal telephones expanded so that through mini-cell sites installed on building fronts and lamp posts PHS user is virtually always within range of dial tone.

Matsushita Consumer Electronics insists it is on target to begin delivery into US of DVC camcorder by October. The 3 CCD pickup camera will have a suggested retail price of approximately US$3,000. Sony has also announced two DVC camcorder models, a 3 CCD pickup model at US$4,000 and a single CCD unit at US$2,700. Sony has not announced plans to distribute models in US at this time; plans Japan sale of both models to begin September 10th.

CABLE/FIBRE/MDS PAY TV

A Canadian promoter claims to be planning an investor backed cable television for Rotorua with a construction start of November or December. Ron Theaker, trading as Pacificom Limited NZ, is said to be planning a four satellite dish headend approximately 6km removed from Rotorua proper with 15-plus channels of programming. Theaker, reportedly at one time a close associate of Philip Blain, then the Manager of International Planning for Telecom, has been in and out of New Zealand for several years trying to drum up interest in cable TV projects here. At various times he has stated plans to cable Hamilton, Taupo and more recently Tauranga. Pacificom has held NOS (Network Operator Status) since March 1992.

The Hastings Motel (Hastings) now boasts 17 channels of television to residents, a combination of local terrestrial service, SKY Network's 5 channels and 8 channels supplied via satellite. The motel has been advertising "Children's Fantasy Weekends" offering families the non-stop (14 hour per day) Cartoon Channel as an enticement to stay with them.

SKY's attempt to climb beyond the 200,000 subscriber mark by 1 August may have been achieved by neglecting to disconnect subscribers who during July discontinued their subscriptions. Installers in at least the Auckland area are complaining about a slow down in new installs with many saying they are now fortunate to do two complete installs per day.

The Barrycourt Motor Inn, Parnell (Auckland), has completed wiring of their 120 units with 450 MHz bandwidth cable television quality equipment in preparation for delivery of 18+ channels of terrestrial and off-satellite service. The facility has two operating dishes, two more are scheduled for installation during September. Satellite programme channels will come from Optus B1, PanAmSat PAS-2, Rimsat G2 and AsiaSat 2 with plans to add service from Palapa C1 in the first half of 1996. A cable quality headend has been installed with individual channel processors and modulators on 20 initial channels, including two locally generated text channels (BarryVision 1, Barryvision 2) which will feature material about the facility and the tourism opportunities within Auckland and Parnell. The Barrycourt pioneered motel satellite reception with AFRTS in the mid 80s, has continued to use a satellite dish and is not a SKY affiliate. Under the operating name of Barryvision Ltd., the firm recently received Network Operator (status) from the Ministry of Commerce. The facility caters to a significant number of overseas visitors each and year the satellite service will include Japanese, Chinese, Hindi, French and Papua New Guinea programming in each room.

Australian supplier Bell IRH Components (Sydney) is planning a closed door seminar for members of the BCL engineering team in September dealing with cable TV and MMDS techniques the topic. Bell is gearing up for both industries in Australia, does not want New Zealand users to be left out.

Movielink (New Zealand) Limited, firm formed to market pay per view movies through major New Zealand hotels, has as two principal officers John Michael Fellett (of Sky NZ) and Sino Alfonso Vito Guzzardi, a member of the Australian family that operates Movielink (Australia). First system is still being installed at (Auckland's) Carlton Hotel and is using headend (origination and accounting equipment) provided by Australia. A similar, competitive, system is being promoted to Auckland area hotels and larger motels uses basic software systems created by Pacific Pay Video. Movielink service has been promoted to date as partnership with the hotel supplying a sales environment while Movielink provides all of the hard and software. Pacific Pay Video based service is more of an outright sale requiring significant up front investment by hotel or motel owner. Movielink is also exploring moving out of the major city areas to resort areas such as the Bay of Islands.

New York telephone firm NYNEX has stopped testing of analogue format VDT (video dial tone) system in Manhattan (NY) and says it will now sit back and await further developments of all digital delivery systems. NYNEX joins Bell Atlantic and other major US telephone firms in pulling sharply back from plans to launch analogue based VDT services using hybrid fibre optic plus coaxial delivery schemes.

United Investment Holdings (UIH), which owns controlling interest in Kiwi Cable, has signed an agreement with Australian Foxtel (cable) which allows a subsidiary known as XYZ Entertainment to have four channels of its TV programming carried by Foxtel in Australia. XYZ produces programming for cable TV there, and had sought an arrangement to allow it to be assured wide scale distribution of that programming. Foxtel acquires a portion of XYZ in the deal in return for agreeing to carry the four programme channels.

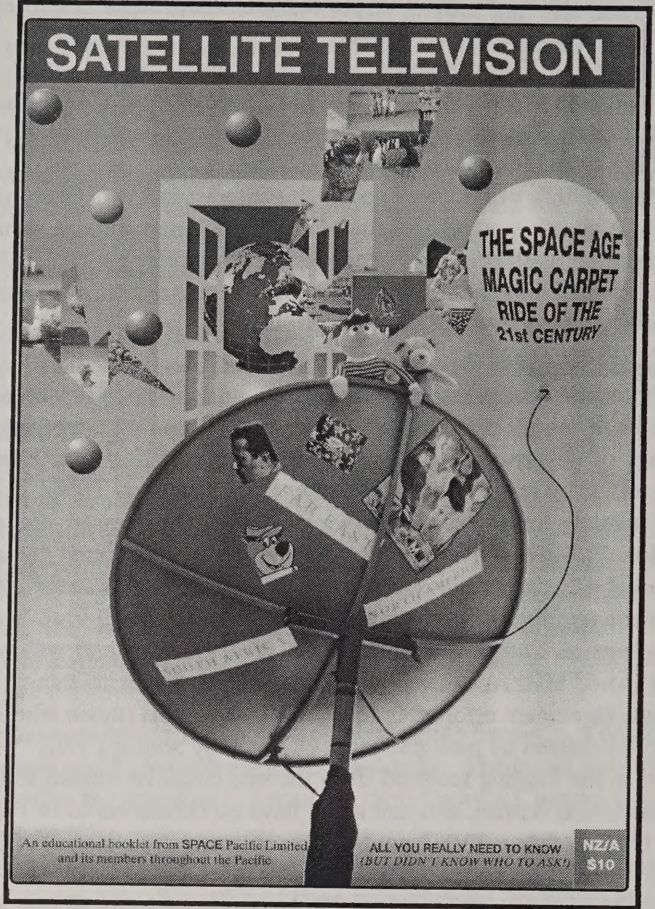
TERRESTRIAL BROADCASTING

TVNZ's departing chief executive Brent Harman has left behind a riddle to be solved by those who continue to carry the national television torch. As CTD reported in our issue 9506 (p. 20) a working paper submitted by TVNZ engineering to a select group of department heads at the Ministry of Commerce is proposing that sets of UHF television channels left unassigned by reserved for replacement of present day TVNZ band I frequencies when New Zealand makes official conversion from present day analogue to compressed digital transmission techniques. Harman suggested that "*when TVNZ is sold to private interests* (he mentioned "*within the next five years*") *a national public service channel without commercials should be established by using UHF channels.*" This suggests two possible scenarios; there are undoubtedly others. One, anyone purchasing TVNZ "*within five years*" will see the early approach of digital conversion from analogue terrestrial transmissions and will itself wish to prepare for the conversion. Band I channels (45-68 MHz) are notoriously poor choices for digital transmission because of multi-path (ghosting) effects which create significant error rates for data transmissions (those who live where Teletext is erratic can already see this effect; often caused by multipathing). Or, two, by selling TVNZ "*within five years*" Harman is merely suggesting that some of the funding received from the sale could be utilised to build a national UHF public service (sans commercials) television service, and that it will have no choice but to be **(a)** digital, and, **(b)** in the only spectrum remaining; i.e., at UHF. Related: TVNZ paid the government a "dividend" of $35.6 million for the current year as well as a tax bite of $21.8m.

Telecom's "take over" of a reported 25% of Sky (pay TV) Network continues to be a matter of some investigation by the Commerce Ministry. Under the late June announced sale, Telecom parent Bell Atlantic and US telephone firm Ameritech, each of whom owned 25% of a firm called HKP Partners of New Zealand Limited, sold their 50% of HKP to Telecom. HKP in turned owns 51% of Sky. Therefore on a stock basis, a firm that controls HKP also exerts a very slight majority stock control over SKY itself. In CTD for last September (CTD 9409; p.19) Sky's John Fellett told us, "*Bell Atlantic and Ameritech have always had the right to sell down their shares and the first call on any shares they might wish to dispose of would go to Telecom. That could happen in the next 12 months but it is a shareholder, not a management issue.*" That Telecom's new position in Sky is anything more significant than a "shareholder change" is not certain although speculation concerning massive top level personnel changes in the network are frequent. Telecom already owns 8 of the 12 MMDS frequencies for New Zealan (CTD 9502; p.2) and has been experimenting with a very limited fibre optic consumer home test since the spring of 1993 (CTD 9309; p.2). More recently Telecom announced a plan to gradually increase its fibre optic coverage in New Zealand but a close inspection of their plans suggests the fibre optic cable will be limited to very specific target areas, mostly in highly dense population regions and downtown business centres, for the coming 5 year period. Sky is in the programming business; Telecom has repeated stated it is in the delivery business and the two firms do not share a common bond between the importance of programming and the importance of delivery. Telecom believes the delivery is the key to business success while Sky believes the delivery system is nothing more than an necessary evil to be tolerated; the money, they believe, is in the packaging of programming. In its limited fibre optic consumer testing in the Auckland New Lynn and Pakuranga regions, Telecom has shied away from becoming involved in the programming aspect of multiple channel TV delivery and contracted that work out to firms such as TVNZ. More importantly, Telecom parent Bell Atlantic has repeated been rebuffed stateside in its attempts to enter the programming end of the cable TV business there.

NOTE: This is our "winter break period"; next issue of CTD will be October 6.

CONFUSED BY SATELLITE?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